s18quiz: EXP LOG (Solution v141)
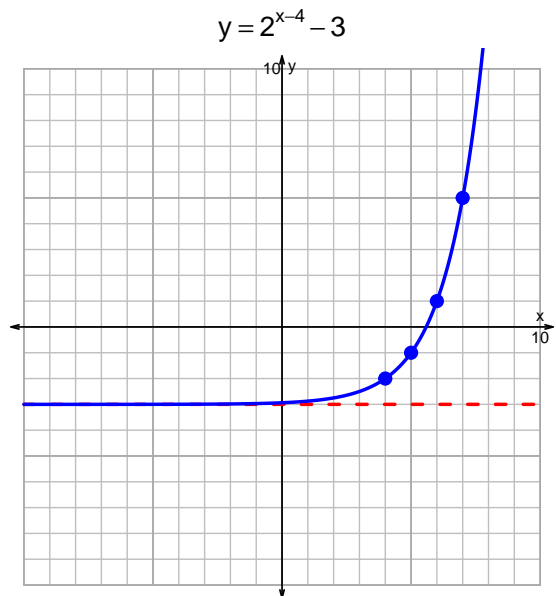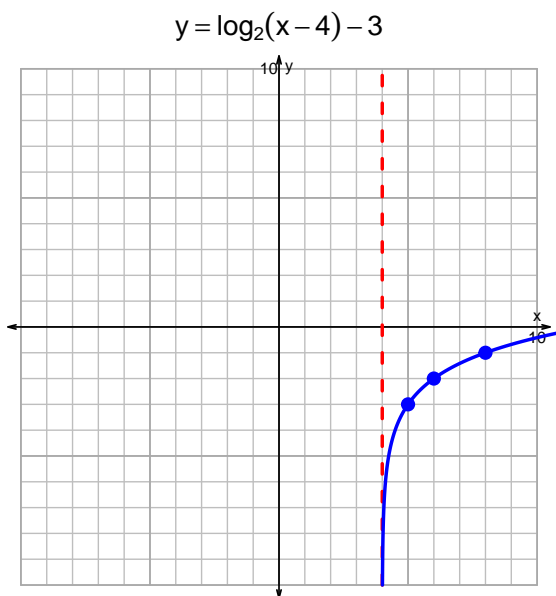
1. Graph $y = \log_2(x - 4) - 3$ and $y = 2^{x-4} - 3$ on the grids below. Also, draw any asymptotes with dotted lines.

$$y = \log_2(x - 4) - 3$$

$$y = 2^{x-4} - 3$$

2. Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression.

$$17 = \left(\frac{4}{7}\right) \cdot 2^{5t/3}$$

Divide both sides by $\frac{4}{7}$.

$$\frac{17 \cdot 7}{4} = 2^{5t/3}$$

Take log, base 2, of both sides.

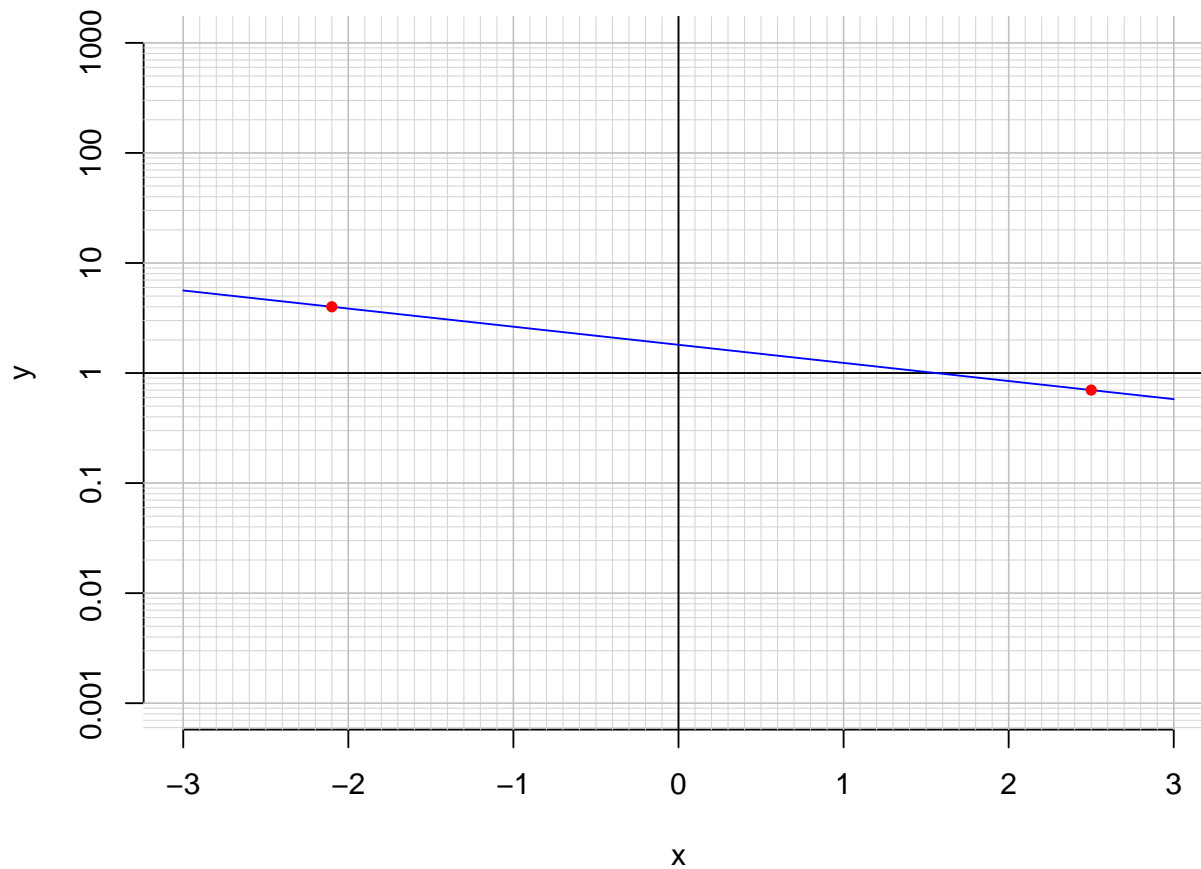$$\log_2\left(\frac{17 \cdot 7}{4}\right) = \frac{5t}{3}$$

Divide both sides by $\frac{5}{3}$.

$$\frac{3}{5} \cdot \log_2\left(\frac{17 \cdot 7}{4}\right) = t$$

Switch sides.

$$t = \frac{3}{5} \cdot \log_2\left(\frac{17 \cdot 7}{4}\right)$$

3. An exponential function $f(x) = 1.81 \cdot e^{-0.379x}$ is graphed below on a semi-log plot.

a. Using the plot above, evaluate $f(-2.1)$.

$$f(-2.1) = 4$$

b. Express $f^{-1}(x)$, the inverse of f.

$$f^{-1}(x) = \frac{-1}{0.379} \cdot \ln\left(\frac{x}{1.81}\right)$$

c. Using the plot above, evaluate $f^{-1}(0.7)$.

$$f^{-1}(0.7) = 2.5$$